

CLAIMS

Amend the claims as follows:

1. (Currently amended) ~~A method of designing a scanning head for a scanner, wherein the scanner has a platform and a scanning head with the scanning head capable of moving along a scanning direction to scan a document placed on the platform, the method scanner, comprising:~~

a scanner casing having an opening;

providing a shell body of the scanning head having a long side, wherein a length of the long side is smaller than a length of the platform along a direction perpendicular to the configured to move along a scanning direction within the scanner casing; and

providing a scattering light source mounted on the scanning head, wherein the light source is configured to project light through the opening of the scanner casing long side of the shell body for producing a parallel beam of light, and wherein a longest side of the light source length of the scattering light source is smaller than the opening along a dimension generally perpendicular to the scanning direction of the scanning head or equal to the length of the long side of the shell body;

providing a plurality of reflecting mirrors within the shell body;

providing a lens within the shell body; and

providing a photo sensor within the shell body, wherein the parallel beam from the light source projecting onto the platform will sequentially pass through the reflecting mirrors and the lens to arrive at the photo sensor after reflection.

2. (Currently amended) ~~The method scanner of claim 1, wherein the further comprising a plurality of reflecting mirrors of variable lengths, wherein the plurality of reflecting mirrors are configured to reflect the light onto a photo-sensor as a cone of light have a length smaller than or equal to length of the scattering light source.~~

3. (Currently amended) The ~~method scanner~~ of claim 1, further comprising a platform configured to support a document to be scanned, wherein a length of the parallel light beam projecting onto the platform is larger than the opening along the dimension generally or equal to the length of the platform in a direction perpendicular to the scanning direction of the scanning head.

4. (Currently amended) The ~~method scanner~~ of claim 1 ~~2~~, wherein the each of the plurality of reflecting mirrors has have a longest side associated with the variable lengths, and wherein the longest side fits within the cone of light scattering light source includes a scattering lamp tube.

5. (Currently amended) A method, ~~of designing an optical path for a scanner,~~ wherein the scanner has a platform and a scanning head, and the scanning head being movable in a scanning direction to scan a document placed on the platform, the method comprising:

providing projecting light from a scattering light source mounted on the a scanning head through an opening of a scanner body, wherein a length of the scattering light source along a dimension generally perpendicular to a scanning direction is smaller than a length of the opening a window on the platform along a direction the dimension generally perpendicular to the scanning direction of the scanning head;

scattering the light from a document positioned adjacent to the opening on a transparent platform; and

providing reflecting the light from a plurality of reflecting mirrors sequentially positioned along an optical path between beyond the document and a lens;

providing a lens positioned along an optical path beyond the plurality of reflecting mirrors; and

positioning a photo-sensor so that a parallel beam from the scattering light source being projected onto the platform will sequentially pass through the reflecting mirrors and the lens to arrive at the photo-sensor.

6. (Currently amended) The method of claim 5, wherein the plurality of reflecting mirrors are sized to fit within a cone of light projected onto the lens scattering light source includes a scattering lamp tube.

7. (Currently amended) The method of claim 5, wherein a length and a width of the transparent platform are larger than a length and a width of the opening ~~the reflecting mirrors have a length smaller than or equal to the length of the scattering light source.~~

8. (Currently amended) The method of claim 5, further comprising:
projecting the ~~parallel beam from the scattering light source~~ onto the transparent platform to produce a scan line;

~~defining a length of,~~ wherein the scan line as defines a maximum width of scanning on the document; and

~~wherein the length of the scan line, and wherein the maximum width is greater than the~~ length of the light source along the dimension generally perpendicular to the scanning direction of the scanning head ~~an optimal width of the window on the platform.~~

9. (Currently amended) A scanner, comprising:
an outer casing having an opening section and supporting surfaces positioned below the opening section, wherein the opening section has having a length and a width circumference defining an area of the opening section; and

a platform having a peripheral edge ~~forming an area of the platform, at least a portion of the peripheral edge being~~ supported by the supporting surfaces, wherein the length and the width area of the platform ~~is at least approximately identical to the area of~~ are greater than the length and the width of the opening section;

a scanner head configured to move along a scanning direction generally perpendicular to the length of the opening; and

a light source mounted within the outer casing on the scanner head and configured to project light through the opening section onto a document to be scanned, wherein a longest side of the light source is shorter than the length of the opening.

10. (Currently amended) A ~~scanning head for a scanner, wherein the scanner has a platform for putting a document, and the scanning head is capable of moving forward in a scanning direction to scan the document, the scanning head comprises~~ comprising:

a scanner body having an opening defined by a width and a length;

a transparent platform mounted to the scanner body adjacent to the opening, wherein a width and a length of the transparent platform are greater than the width and the length of the opening;

a scan head configured to move in a scanning direction within the scanner body, wherein the scanning direction is generally perpendicular to the length of the opening shell body with a long side, wherein a length of the long side is smaller than a length of the platform in a direction perpendicular to the scanning direction; and

a scattering light source mounted on the scan head and configured to project light through the opening and onto the transparent platform long side of the shell body for producing a parallel beam of light, wherein a longest side of the scattering light source has a length smaller than or equal to the length of the opening long side of the shell body;

a plurality of reflecting mirrors within the shell body;

a lens within the shell body; and

a photo-sensor within the shell body, wherein the parallel beam from the light source projecting onto the platform sequentially passes through the reflecting mirrors and the lens to arrive at the photo-sensor after reflection.

11. (Currently amended) The ~~scanning head scanner~~ scanner of claim 10, wherein the scattering light source ~~includes~~ comprises a scattering lamp tube.

12. (Currently amended) The ~~scanning head scanner~~ scanner of claim 10, wherein the length of the scan area is approximately the same as a distance between two inner side walls of the scanner body~~reflecting mirrors have a length smaller than or equal to the length of the scattering light source.~~

13. (Currently amended) A scanner for scanning a document, comprising:
an outer casing with an opening section;
a platform mounted over the opening section comprising a platform surface for supporting the document; and
a scanning head positioned within the outer casing, wherein the scanning head is ~~capable of moving~~ configured to move forward in a scanning direction to scan the document, and
wherein the scanning head ~~further includes~~ comprises:

a shell body with a ~~long~~ longest side, wherein a length of the ~~long~~ longest side is smaller than a length of the ~~platform~~ opening in a ~~direction~~ dimension generally parallel to the platform surface and generally perpendicular to the scanning direction; and

a ~~scattering~~ light source mounted on the ~~long~~ longest side of the shell body ~~for producing a beam of light~~, wherein the ~~scattering~~ light source has a longest length smaller than or equal to the length of the ~~long~~ longest side of the shell body;

~~a plurality of reflecting mirrors within the shell body;~~

~~a lens within the shell body; and~~

~~a photo-sensor within the shell body positioned so that when the beam of light is projected onto the platform, the beam of light sequentially passes through the reflecting mirrors and the lens to arrive at the photo-sensor;~~

~~a linear guide within the outer casing for guiding the scanning head; and~~

~~a driving device within the outer casing for driving the scanning head.~~

14. (Currently amended) The scanner of claim 13, wherein the ~~scattering~~ light source ~~includes~~ comprises a scattering lamp tube.

15. (Currently amended) The scanner of claim 9, wherein the platform abuts the outer casing.

16. (Currently amended) The scanner of claim 9, further comprising a plurality of reflecting mirrors of variable lengths, wherein the plurality of reflecting mirrors are configured to reflect the light onto a photo-sensor as a cone of light, wherein each of the plurality of reflecting

mirrors has a longest side associated with the variable lengths, and wherein the longest side fits within the cone of light a scanning head movable in a scanning direction to scan a document placed on the platform.

17. (Currently amended) The scanner of claim ~~16~~ 9, wherein a shell body of the scanning head has a ~~long~~ longest side, and wherein a length of the ~~long~~ longest side of the shell body is smaller than a length of the platform along a direction generally perpendicular to the scanning direction.

18. (Currently amended) ~~A scanning head for a scanner, wherein the scanner has a platform for placing a document, and the scanning head is movable in a scanning direction to scan the document, the scanning head comprising:~~

a scanner body;

a scanning platform mounted adjacent to an opening of the scanner body, wherein the scanning platform comprises a scanning surface configured to support a document;

a scan head configured to move in a scanning direction within the scanner body

a shell body with a long side, wherein a length of the ~~long~~ a longest side of the scan head is smaller than a length of the platform in a direction generally parallel to the scanning surface and generally perpendicular to the scanning direction; and

a light source mounted to the scan head and configured to project light through the opening

~~wherein a photo-sensor is installed inside the shell body.~~

19. (Currently amended) The scanning head scanner of claim 18, further comprising a plurality of reflective mirrors of different lengths wherein a lens is installed positioned inside the scan head shell body.

20. (Currently amended) The scanning head scanner of claim ~~18~~ 19, further comprising a photo-sensor positioned inside the scan head, wherein the plurality of reflective mirrors are configured to reflect the light onto the photo-sensor as a cone of light, wherein each

of the plurality of reflecting mirrors has a longest side associated with the different lengths, and wherein the longest side fits within the cone of light scattering light source mounted on the long side of the shell body for producing a parallel beam of light, wherein the scattering light source has a length smaller than or equal to the length of the long side of the shell body.

21. (Currently amended) A scanning system, comprising:
means for moving a scan head in a scanning direction within a scanner body;
means for projecting light through an opening of the scanner body onto a document,
wherein a longest length of the means for projecting light is smaller than a length of the opening along a dimension generally perpendicular to the scanning direction of the scan head;
means for scattering the light from the document; and
means for reflecting the light along an optical path between the document and a lens,
wherein the light is reflected to the lens as a cone of light
means for accommodating a document to be scanned;
means for imaging the document;
means for containing the means for imaging;
means for moving the means for containing in a scan direction, wherein the means for containing is smaller than the means for accommodating in a direction perpendicular to the scan direction.

22. (Currently amended) The scanning system of claim 21, wherein the means for ~~accommodating comprises an outer casing and a platform~~ reflecting the light is substantially positioned within the cone of light.

23. (Currently amended) The scanning system of claim ~~22~~ 21, wherein the means for projecting the light is substantially positioned within the cone of light ~~a width of a window on a platform accommodates a width of an A4 size document.~~

24. (Currently amended) The scanning system of claim 21, wherein the means for projecting light is mounted on the scan head ~~imaging comprises a plurality of reflecting mirrors, a lens, and a photo sensor.~~

25. (Currently amended) The scanning system of claim 21, further comprising means for supporting the document on a scanning surface, wherein the dimension generally perpendicular to the scanning direction of the scan head is generally parallel to the scanning surface ~~means for containing comprises a shell body with a long side, wherein a length of the long side is smaller than the means for accommodating in a direction perpendicular to the scanning direction.~~

26. (Previously presented) The scanning system of claim 21, wherein the means for moving comprises a linear guide and a driving device.